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POWER AND MECHANICS RESEARCH AS REPORTED FOR 1948

ELECTRICAL ENGINEERING

On 6 April 1949 the Bureau of the Department of Technical Sciences (OTN), Academy of Sciences USSR, heard and discussed an account of the scientific research activity of the Power Engineering Institute imeni G. M. Krzhizhanovskiy, Academy of Sciences USSR, during 1948. The account was based on a report of the Director of the Institute, Academician G. M. Krzhizhanovskiy, and a coreport of the Chairman of the OTN commission, Academician A. M. Terpigorev.

The OTN Bureau noted results achieved by the Institute in 1948 in many spheres of power, electrical engineering, and thermal engineering: complex electrification of agriculture on the basis of using an "electrotractor" of the ENIN-VIME system (Power Engineering Institute, All-Union Institute for Mechanization and Electrification of Agriculture) cathode ray oscillographs; the ENIN system binary boiler; flameless combustion water-heating boilers, etc.

The Institute has completed the following projects which are ready for applications:

An electrothermal scheme for utilizing the low-temperature secondary resources of industrial production; an electric power scheme for utilizing the high-temperature secondary power resources of pyrotechnological processes; an AC-commutator generator with frequency regulation independent of the rotation speed; the RAN automatic equipment for distributing the load between power stations of a power system, and a heat exchanger for air preheating.

In 1948, 75 works were published by members of the Institute, five of which were monographs. In the electrical engineering section of the scientific council, 20 scientific and scientific organizational papers were read; in the thermal engineering section, 30 papers; in the electrothermic chemical section, 14 papers; in the power section, 12 papers. There were 160 scientific papers read and discussed at seminars on electrical engineering, thermal engineering, electrothermic chemistry, and general power engineering.

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The Institute has carried out considerable work on the coordination of scientific research activity of the Academies of Sciences of union republics, affiliates and bases of the Academy of Sciences USSR, branch institutes and higher technical educational institutions in the fields of research on individual power problems.

In 1948, five extensive scientific conferences were held on the following topics: coordination of scientific activities of the power-engineering institutions of the Academy of Sciences USSR and Academies of Sciences of the union republics; problems of transmitting electric power over long distances, industrial power, and problems of shale utilization. The high pressure steam commission held three scientific and technical sessions on the following problems: high pressure turbines and the selection of parameters for super-high steam; rust-resisting steels; and the thermodynamic properties of high pressure steam.

At the same time, the OTN Bureau noted that the scientific council of ENIN had devoted insufficient attention to the discussion of problems connected with the state and trend of research on large complex power problems. This does not promote solidarity among scientific personnel at work on the solution of these problems. Wide scientific discussions have not as yet been adopted sufficiently by ENIN for organizing criticism and self-criticism in development of party spirit in science and raising the quality of scientific production.

In the first half of 1949, scientific discussions on the following problems were held in the Institute: the transmission of AC electric power over long distances; an AC calculating table; flameless combustion water-heating boilers. The united seminar of the power and electrical-engineering sections have begun to work on a problem, "The Scientific Principles of Complex Power Systems and a Single High-Voltage Network," with the participation of representatives of the planning organizations and the scientific research institutes of industry.

The OTN Bureau noted that the scientific council of ENIN and its sections needed to place their work on a level with the new great tasks of the Institute, which demanded concentration of resources on the most important complex problems of Soviet powers, the further development of scientific discussions, criticism and self criticism among scientific workers.

The management of the Institute was entrusted with the task of devising a plan for introduction of results of scientific work into the national economy. Fulfillment of this plan was to be placed under day-to-day supervision.

WORK OF MECHANICS INSTITUTE

An account of the scientific research activity in 1948 of the Institute of Mechanics, Academy of Sciences USSR, was examined at a session of the OTN Bureau, Academy of Sciences of the USSR, held 20 April 1949. A report was read by the Director of the Institute, Corresponding Member of the Academy of Sciences USSR, N. G. Chetayev, and a coreport was read by Academician B. N. Yur'yev, chairman of a commission which acquainted itself beforehand with the results of the Institute's activity.

The OTN Bureau noted results achieved by the Institute in the past year on the theory of stability of irregular motions, on the single dimensional problem of elastoplastic wave propagation and the three-dimensional filtration problem.

Active Members of the Academy of Sciences Uzbek SSR, Kh. A. Rakhmatulin and I. A. Charnyy, scientific collaborators of the Institute, were awarded Stalin prizes for their work in 1948. Two volumes of the works of Academician N. Ye. Kochin were prepared for publication, and the basic preliminary work for publishing the works of Academician B. G. Galerkin was carried out.

There were 65 papers published by collaborators of the Institute. Corresponding Member of the Academy of Sciences of the USSR A. A. Il'yushin published a monograph entitled "Plasticity," and D. M. Millionshchikov, in coauthorship with Academician S. I. Khristianovich and others, published a paper entitled "Applied Gas Dynamics." In 1948, two monographs summing up many years of work carried out in the Institute on the development of the technical theory of coatings, thin-walled tubes, and structures (V. Z. Vlasov), and on the theory of creep (Yu. N. Rabotnov), were prepared for publication. The Institute published six issues of the journal, "Applied Mathematics and Mechanics," and two issues of the "Engineering Symposium."

Five scientific seminars were working in the Institute during 1948, on general mechanics, aerodynamics, and construction mechanics. Ninety papers were read at the seminars.

While noting the positive results of the work of the Institute, the OTN Bureau remarked that it is not paying sufficient attention to research on methodological problems of mechanics. Work on aeromechanics has still not developed as it should. The OTN Bureau recommended that the Institute increase experimental investigations in 1949.

ACCOUNT OF MACHINE STUDIES

An account of the scientific research activity of the Institute of Machine Studies during 1948, on the report of the Director of the Institute, Academician Ye. A. Chudakov and the coreport of Academician B. N. Yur'yev, was examined at a session of the OTN Bureau, 4 May 1949.

The OTN Bureau noted results achieved by the Institute in devising new methods for calculating the strength of parts working under conditions of relaxation and creep, studying the theory and methods of determining a new characteristic for strength of metals (tensile strength), and the theory of a dynamically loaded bearing. The Institute prepared a number of projects ready for applications: polarization -- optical devices for determining the stresses in machine parts, a no-load economizer, a rotation viscometer, and converting gasoline automobiles to use liquified and compressed gas.

Collaborators of the Institute of Machine Studies published 80 scientific works, including 17 monographs and symposiums. Sixty-five scientific papers were read at seminars. The Institute carried out work on developing and strengthening its own experimental base and manufactured many designs of testing machines and instruments.

The OTN Bureau recommended that the management of the Institute work out concrete measures to ensure that the completed scientific projects of the Institute will be rapidly introduced into industry. It was suggested to the management that it should arrange for systematic accounts of the work of aspirants and scientific leaders at the sessions of the Scientific Council.

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